

5.6 STORMWATER PROBLEMS AND CONTROL MEASURES

Surface runoff is the principal controllable source of pollutants affecting Lake Tahoe. Development of the watershed has greatly accelerated natural erosion rates and increased nutrient loading in stormwater. Disturbance of soils and vegetation, particularly in Stream Environment Zones, has reduced the natural treatment capacity for nutrients in stormwater. Impervious surfaces collect pollutants from vehicles and atmospheric sources and discharge them in stormwater. Infiltration of precipitation is greatly reduced; surface runoff dramatically increases, and downstream rill and gully erosion are increased. Stormwater from some land use types, such as golf courses and other areas of heavy fertilizer use, may be particularly rich in nutrients. The 208 Plan (Vol. 1, page 92) identifies stormwater problems associated with urban and roadside drainage systems, snow disposal and increased impervious surface coverage.

Chapter 4 of this Basin Plan includes a more general discussion of stormwater problems and regionwide control measures. Most of the control measures discussed in this Chapter (including limits on development of fragile lands and on total impervious surface coverage, remedial erosion control, excess coverage mitigation and SEZ restoration programs, fertilizer management, and requirements for use of BMPs for erosion and drainage control) are meant to prevent or mitigate stormwater impacts.

The 208 Plan (Vol. I, page 91) states that management practices to control elevated levels of runoff from existing development should be geared toward treatment of runoff waters through the use of natural and artificial wetlands as close to the source of the problem as possible. Management practices should also infiltrate runoff to negate the effects of increased impervious coverage and drainage density. Management practices should ensure that snow disposal does not harm water quality, and that snow removal from unpaved areas does not expose soils to runoff and further disturbance, contributing to sediment and nutrient loading to receiving waters. This section focuses on effluent limitations, stormwater permits and areawide stormwater

treatment systems.

Effluent Limitations

In 1980, the State Board adopted an earlier version of the stormwater effluent limitations set forth in Table 5.6-1. The Regional Board uses these effluent limitations in discharge permits for stormwater. Effluent limitations for additional pollutants, especially for toxic substances, may be necessary to ensure compliance with receiving water standards. The “design storm” for stormwater control facilities in the Lake Tahoe Basin is the 20-year, 1-hour storm; however, containment of a storm of this size does not necessarily ensure compliance with effluent limitations or receiving water quality standards.

The 208 Plan incorporates the State Board's 1980 effluent limitations, and TRPA has adopted them as regional “environmental threshold carrying capacity standards” for ground water, with the addition of the following provision:

“Where there is a direct and immediate hydraulic connection between ground and surface waters, discharges to groundwater shall meet the guidelines for surface discharges.”

TRPA has also adopted the following environmental threshold standard related to surface runoff:

Numerical standard

Achieve a 90 percentile concentration value for dissolved inorganic nitrogen of 0.5 mg/l, for dissolved phosphorus of 0.1 mg/l, and for dissolved iron of 0.5 mg/l in surface runoff directly discharged to a surface water body in the Basin.

Achieve a 90 percentile concentration value for suspended sediment of 250 mg/l.

Management standard

Reduce total annual nutrient and suspended sediment loads as necessary to achieve loading thresholds for tributaries and littoral and pelagic Lake Tahoe.

(The latter standard refers to other TRPA environmental threshold standards which involve reductions in nutrient loading from all sources.)

Table 5.6-1 includes revisions of the 1980 limitations. The Lahontan Regional Board applies the numbers in Table 5.6-1 on a site- or project-specific basis in

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response to identified erosion or runoff problems. Monitoring through 1988 showed that urban runoff exceeds the limitations for discharge to surface waters in more than 90 percent of the samples taken (208 Vol. 1 page 262).

The effluent limitations at the top of Table 5.6-1 apply to stormwater discharges to surface waters, and generally to surface runoff leaving a specific project site. If surface runoff enters a project site from upgradient, its quality and volume may together with the quality and volume of runoff generated onsite, affect the quality of runoff leaving the site. Regional Board stormwater permits for sites where offsite stormwater enters the property will take these effects into consideration. In general, where the quality of runoff entering the site is worse than that of runoff generated on site, there should be no statistically significant increase (at a 90 percent confidence level) in pollutants in the water discharged from the site. If the quality of runoff entering the site is equal to or better than the quality of runoff generated on the site, stormwater exiting the site should be of the quality which would be expected if there were no onsite runoff (i.e., onsite stormwater should not degrade clean runoff flowing through the site).

The effluent limitations at the bottom of Table 5.6-1 apply to stormwater discharges to infiltration systems. Infiltration systems include, but are not limited to, trenches, dry wells, ponds, vaults, porous pavement and paving stones. Infiltration effectively filters out sediments and results in reductions in heavy metals, oil and grease, and nutrients bound to particulate matter. Dissolved nutrient concentrations can be reduced by incorporating vegetation and an organic soil layer into the infiltration system (e.g., grass-lined swales, vegetated ponds, etc.) Since runoff is treated by infiltration through vegetation and soil layers, the effluent limits are greater for discharges to infiltration systems. Locating infiltration systems in areas of high ground water may result in ground water contamination and reduced percolation rates. Therefore, discharges to infiltration systems located in areas where the separation between the highest anticipated ground water level and the bottom of the infiltration system is less than five (5) feet may be required to meet the effluent limits for stormwater discharges to surface waters.

Stormwater Permits

The Lahontan Regional Board regulates stormwater discharges in the Lake Tahoe Basin through waste discharge requirements for individual dischargers, and through stormwater NPDES permits. As noted in elsewhere in this Chapter, the Regional Board has an active program to ensure the retrofit of BMPs to existing development in the Lake Tahoe Basin. This includes the retrofit of stormwater control measures. The regionwide stormwater NPDES permit program is summarized in Chapter 4; additional information is provided in the statewide BMP Handbooks for municipal, construction, and industrial stormwater NPDES permits (APWA Task Force, 1993).

In 1980, the State Board adopted a requirement that municipal and stormwater NPDES permits be issued for local governments on the California side of the Lake Tahoe Basin (and also recommended that such permits be issued on the Nevada side). This direction preceded the USEPA's development of nationwide regulations for stormwater NPDES permits, and the USEPA was reluctant for such permits to be issued at Lake Tahoe in the early 1980s. The Lahontan Regional Board adopted areawide stormwater waste discharge requirements for local governments (Placer and El Dorado Counties and the City of South Lake Tahoe) in 1984. Following the development of nationwide USEPA stormwater regulations, the Regional Board adopted municipal stormwater NPDES permits for these entities in 1992. (Although the permanent resident populations of these municipalities within the Lake Tahoe Basin are less than 100,000, too small to trigger the automatic requirement for municipal stormwater NPDES permits, the State has determined that stormwater from these areas is a significant contributor of pollutants to Lake Tahoe, and that such permits are necessary.)

Municipal NPDES permits require preparation of stormwater management programs, which must cover the topics summarized in Table 5.6-2. Municipal stormwater management programs must (1) address appropriate planning and construction procedures, (2) ensure BMP implementation, inspection and monitoring at construction sites, and (3) provide for education or training for construction site operators.

Coordination among municipal, industrial and construction stormwater permittees in the same geographic area is expected as part of the NPDES

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process. As noted in Chapter 4, NPDES permit conditions to control stormwater from state highways may be included in the municipal permit or in a separate permit issued to the highway authority. In 1993, the Regional Board has adopted a separate municipal stormwater NPDES permit for Caltrans to address discharges from California State highways within the Lake Tahoe Basin.

The municipal stormwater NPDES permits for the Lake Tahoe Basin will be important vehicles for ensuring implementation of the remedial Capital Improvements and Stream Environment Zone Restoration Programs and obtaining compliance with BMP retrofit schedules.

The statewide construction stormwater NPDES permit for projects involving one-time or cumulative disturbance of five or more acres does **not** apply within the Lake Tahoe Basin. The Regional Board has the authority to issue individual stormwater NPDES permits for larger Tahoe construction projects, and has adopted a general NPDES permit for such projects, which will be implemented together with current general waste discharge requirements for small commercial, recreation public works, and multifamily residential projects. New projects are reviewed individually, and are required to submit reports of waste discharge before being placed under the general requirements.

There is no heavy manufacturing industry in the Lake Tahoe Basin. However, certain Tahoe dischargers (e.g., recycling facilities, transportation facilities such as the airport and some marinas, and the South Tahoe Public Utility District wastewater treatment plant) are classified as "industrial" for purposes of the statewide industrial stormwater NPDES permit (see the summary of "industrial" categories and the explanation of the statewide NPDES permitting process in Chapter 4). Because of the sensitivity of affected waters, the Regional Board generally adopts and maintains individual stormwater waste discharge requirements for such facilities; individual stormwater NPDES permits may also be issued.

Some of the areas which need surface runoff management systems are on federal land. The sites are operated under special use permits from the USFS, Lake Tahoe Basin Management Unit. The

USFS requires, and should continue to require, compliance with BMPs as a condition of these special use permits. The Regional Board may issue individual stormwater NPDES permits to projects on National forest lands if necessary to protect water quality.

The 208 Plan (Vol.1, page 112) directs the State of California to continue to set effluent limitations and issue discharge permits for stormwater in accordance with the federal Clean Water Act and the Porter-Cologne Act. TRPA considers large parking areas, the South Tahoe airport, golf courses and ski areas high priorities for retrofitting with BMPs because of their potential for significant water quality impacts from runoff. The 208 Plan encourages the states to issue WDRs or NPDES permits to these facilities. After 1991, TRPA will work the states to require establishment of BMP retrofit schedules for such facilities for which retrofit schedules have not been established.

TABLE 5.6-1 Stormwater Effluent Limitations

These limits shall apply in addition to any more stringent effluent limitations for the constituents below, or to limitations for additional constituents, which are necessary to achieve all applicable water quality objectives for specific receiving waters.

Surface Discharges

Surface water runoff which directly enters Lake Tahoe or a tributary thereto, shall meet the following constituent levels:

<u>Constituent</u>	<u>Maximum Concentration</u>
Total Nitrogen as N	0.5 mg/l
Total Phosphate as P*	0.1 mg/l
Total Iron	0.5 mg/l
Turbidity	20 NTU
Grease and Oil	2.0 mg/l

See the text for discussion of the application of these limits to runoff generated on a discharge site in relation to the quality of runoff entering the site.

Runoff Discharged to Infiltration Systems

Waters infiltrated into soils should not contain excessive concentrations of nutrients which may not

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be effectively filtered out by soils and vegetation. See the text for further discussion of the application of these limits:

Constituent	Maximum Concentration
Total Nitrogen as N	5 mg/l
Total Phosphate as P*	1 mg/l
Total Iron	4 mg/l
Turbidity	200 NTU
Grease and Oil	40 mg/l

Note: *Total phosphate is measured as "total phosphorus."

procedures

- Monitoring of significant industrial discharges

For Construction and Land Development Activities:

- Water quality and BMP assessments during site planning
 - Site inspection and enforcement procedures
 - Training for developers and contractors
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TABLE 5.6-2
Activities to be Addressed in
Municipal Stormwater Management
Programs (Adapted from: APWA Task Force, 1993)

For Residential/Commercial Activities:

- Roadway and drainage facility operations and maintenance programs
- BMP planning for new development and redevelopment projects
- Retrofitting existing or proposed flood control projects with BMPs
- Municipal waste handling and disposal operations
- Pesticide, herbicide, and fertilizer use controls

For Improper Discharge Activities:

- Prevention, detection and removal program for illegal connections to storm drains
- Spill prevention, containment and response program
- Program to promote proper use and disposal of toxic materials
- Reduction of stormwater contamination by leaking/overflowing separate sanitary sewers

For Industrial Activities:

- Inspection and control prioritization and